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AMENDMENTS TO THE CLAIMS

27. (AMENDED) A process for determining at least one candidate spectral endmember within an image composed of multiple pixels of spectral data comprising:

unmixing the spectral data within each of the multiple pixels into matched spectral data and unmatched spectral data, the matched spectral data being determined based on spectral data that matches at least a first criteria determined by a first criteria threshold;

defining a metric value range, wherein the unmatched spectral data having first metric values within the metric value range are defined as candidate spectra;

ordering the candidate spectra from highest first metric value to lowest first metric value;

comparing each of the candidate spectra, beginning with the candidate spectra having the highest first metric value, to the unmatched spectral data, to determine the frequency with which each of the candidate spectra occurs within the unmatched spectral data; and

calculating a second metric value for each of the candidate spectra, wherein the second metric value combines the frequency of occurrence of each of the candidate spectra within the unmatched spectral data with a first metric value for each of the candidate spectra, wherein the candidate spectra having the largest second metric value is the at least one candidate endmember.

28. (PREVIOUSLY PRESENTED) The process according to claim 27, further comprising applying a second criteria threshold spectral mask to the unmatched spectral data within each of the multiple pixels to determine a subset of pixels whose unmatched spectral data is below the second criteria threshold;

defining a metric value range, wherein the unmatched spectral data from the subset of pixels having first metric values within the metric value range are defined as candidate spectra;

ordering the candidate spectra from highest first metric value to lowest first metric value;

comparing each of the candidate spectra, beginning with the candidate spectra having the highest first metric value, to the unmatched spectral data from the subset of pixels, to determine the frequency with which each of the candidate spectra occurs within the unmatched spectral data from the subset of pixels; and

calculating a second metric value for each of the candidate spectra, wherein the second metric value combines the frequency of occurrence of each of the candidate spectra within the unmatched spectral data from the subset of pixels with a first metric value for each of the candidate spectra, wherein the candidate spectra having the largest second metric value is the at least one candidate endmember.

29. (PREVIOUSLY PRESENTED) The process according to claim 27, wherein the first criteria is first endmember spectra.

30. (PREVIOUSLY PRESENTED) The process according to claim 28, wherein the second criteria is shade.

31. (PREVIOUSLY PRESENTED) A process for determining at least one candidate spectral endmember within an image composed of multiple pixels of spectral data, comprising:

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unmixing the spectral data within each of the multiple pixels into matched spectral data and unmatched spectral data, the matched spectral data being determined based on spectral data that matches at least a first criteria;

defining error values for the unmatched spectral data, wherein the error values are representative of portions of the unmatched spectral data within each of the multiple pixels;

comparing the error values for the unmatched spectral data to a predetermined error value range, wherein the unmatched spectral data having error values within the predetermined error value range are defined as candidate spectra;

comparing each of the candidate spectra, beginning with the candidate spectra having the highest error value, to each of the unmatched spectral data, to determine the frequency with which each of the candidate spectra occurs within the unmatched spectral data; and

calculating a metric for each of the candidate spectra, wherein the metric combines the frequency of occurrence of each of the candidate spectra within the unmatched spectral data with an error value for each of the candidate spectra, wherein the candidate spectra having the largest metric is the at least one endmember.

32. (PREVIOUSLY PRESENTED) The process according to claim 31, wherein the first criteria is a first endmember spectra.

33. (PREVIOUSLY PRESENTED) The process according to claim 31, further comprising calculating a root mean square (RMS) error value for each of the multiple pixels by combining the error values for the unmatched spectral data.

34. (PREVIOUSLY PRESENTED) The process according to claim 33, wherein the step of comparing the error value for each of the unmatched spectral data to a predetermined error value range, wherein spectra having error values within the predetermined error value range are defined as candidate spectra includes:

determining an acceptable range of deviation from the mean RMS error;

comparing each of the RMS error values for each of the multiple pixels to the acceptable range of deviation from the mean RMS error and keeping a subset of multiple pixels that are within the acceptable range.

35. (PREVIOUSLY PRESENTED) The process according to claim 32, wherein the first endmember is a shade endmember and further wherein the shade endmember is determined by a pre-selected baseline percentage of reflectance.

36. (PREVIOUSLY PRESENTED) The process according to claim 32, wherein the first endmember is selected from the group consisting of a vegetation endmember, a soil endmember and a nonphotosynthetic vegetation endmember, with the vegetation endmember being determined by comparing spectral data for the multiple pixels to a known set of vegetation

spectra, the soil endmember being determined by comparing spectral data for multiple pixels to a known set of soil spectra, and the nonphotosynthetic vegetation spectra being determined by comparing spectral data for the multiple pixels to a known set of nonphotosynthetic vegetation spectra.

37. (PREVIOUSLY PRESENTED) The process according to claim 36, wherein the step of comparing the spectral data for the multiple pixels to a known spectral data utilizes at least one spectral mapping algorithm.

38. (PREVIOUSLY PRESENTED) The process according to claim 31, wherein the number of multiple pixels is at most 500.

39. (PREVIOUSLY PRESENTED) The process according to claim 36, wherein the pre-selected baseline percentage of reflectance is at most 1 percent.

40. (PREVIOUSLY PRESENTED) The process according to claim 31, wherein the spectral data is selected from the group consisting of hyperspectral data, multispectral data, and ultraspectral data.

41. (PREVIOUSLY PRESENTED) The process according to claim 31, wherein the unmixing is linear.

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42. (PREVIOUSLY PRESENTED) The process according to claim 31, wherein the unmixing is non-linear.